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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,782	02/13/2001	Christopher Cavallaro	B01-07	2005

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EXAMINER	
HUNTER, ALVIN A	
ART UNIT	**PAPER NUMBER**
3711	

DATE MAILED: 11/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

M

Advisory Action	Application No.	Applicant(s)
	09/782,782	CAVALLARO ET AL.
	Examiner	**Art Unit**
	Alvin A. Hunter	3711

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

a) ☐ The period for reply expires ______months from the mailing date of the final rejection.

b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1.☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.

2.☐ The proposed amendment(s) will not be entered because:

(a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);

(b) ☐ they raise the issue of new matter (see Note below);

(c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

(d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____.

3.☐ Applicant's reply has overcome the following rejection(s): _____.

4.☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5.☒ The a)☐ affidavit, b)☐ exhibit, or c)☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: *See Continuation Sheet*.

6.☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7.☒ For purposes of Appeal, the proposed amendment(s) a)☐ will not be entered or b)☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____.

Claim(s) objected to: _____.

Claim(s) rejected: *1-16 and 18-28*.

Claim(s) withdrawn from consideration: _____.

8.☐ The proposed drawing correction filed on _____ is a)☐ approved or b)☐ disapproved by the Examiner.

9.☐ Note the attached Information Disclosure Statement(s)(PTO-1449) Paper No(s). _____.

10.☒ Other: *See Continuation Sheet*

Paul T. Sewell
Supervisory Patent Examiner
Group 3700

Continuation of 5. does NOT place the application in condition for allowance because: arguments made by the applicant appear to contradict that which is old, conventional and commonly known within the art. Contrary to applicant's argument, a specific range does not have to be explicitly taught within a reference. The only requirement for 35 USC 103 is that would the differences between what is claimed and the reference been obvious to one of skill in the relevant art. Here Hayashi et al. does prefer that the inner cover be 53 Shor D or less but it is more important that the inner cover be hardner than the outer cover. Though Hayashi et al. does not teach an outer having a Shore D hardness of 56, the result of small hardness degree increase are well known to the art. Furthermore, Hayashi et al. silent as to why the outer cover cannot be any higher than 53 Shore D, therefore how can the reference teach away from something that it is silent upon. It is common knowledge within this art that the cover hardness is varied to control hitting feel. Please note the attached page 413, from Science and Golf III, which illustrates that cover hardness is conventionally varied at the desire of the designer to control resilience and hit feel. There is nothing unobvious or unexpected about this. One knowing this would have found it clearly obvious to have a outer cover of any hardness providing that the outer cover is softer than the inner cover for the reasons above, therefore, applicant's argument regarding hindsight, prima facie, and burden of proof are not persuasive.

Continuation of 10. Other: Attachment: Farrally et al., Science and Golf III Proceedings of the 1998 World Scientific Congress of Golf., Illinios: Human Kinectics, copyright 1999, pages 407, 412 and 413..

Science and Golf III

PROCEEDINGS OF THE 1998 WORLD
SCIENTIFIC CONGRESS OF GOLF

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Human Kinetics

CHAPTER 51

History and Construction of Non-Wound Golf Balls

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Non-wound golf balls today account for about 85% of all balls sold, with wound balls clinging to the balance. While the history of golf balls can be tracked back several centuries, the timeline for the modern golf ball is only about three decades.

The "superball" patented by Wham-O Manufacturing in 1966 probably started the evolution of the non-wound golf ball. This play ball, composed of high Cis polybutadiene and sulfur cured, had extremely high drop rebound in excess of 90%, but at higher impact speeds, the Coefficient of Restitution was reduced to about .650.

This led to the one-piece Bartsch golf ball, patented in 1967. This ball, at the time, was going to revolutionize the golf ball industry—but it didn't. In 1968, Bob Molitor patented a cover blend of polyurethane/ABS that was used on a two-piece "Executive" golf ball; it proved to be short in distance but cut resistance. In 1971, Molitor replaced this cover with DuPont's Surlyn resin. This did revolutionize the golf ball industry. Today, there are now double and triple cores, multi-layer covers, soft over hard, hard over soft, oversize, low moment, high moment golf balls, and the future will bring even further combinations of new materials giving the golfer a myriad of choices.

Keywords: Non-wound golf ball, one-piece, two-piece, multilayer, coefficient of restitution.

INTRODUCTION

High Cis 1,4 polybutadiene, invented in the late 1950s by Ziegler-Natta resulted in a catalyst system that produced stereo regularity in the polymer chain. A Cis 1,4 content as high as 98% is possible using select catalysts. The higher the Cis content, the higher the resilience of the rubber. Without high Cis polybutadiene,

The higher the percent Cis content, the higher the COR. Lithium catalyzed polybutadiene has the lowest Cis content and is very difficult to process. Despite its low Cis content it produces a golf ball core with higher COR than natural rubber, and natural rubber has a Cis 1,4 polyisoprene structure of almost 100%. Polybutadiene types vary in (a) molecular structure (linear, branched), (b) molecular weight characteristics (number, average molecular weight Mn; weight, average molecular weight Mw; and polydispersity Mw/Mn), and (c) type of molecular weight distribution (unimodal, bimodal). All of these properties affect processing and/or final properties.

Zinc oxide is an activator and an efficient high density filler. ZDA is zinc diacrylate, a co-agent that functions as a crosslinking agent and contributes hardness and resilience. TMPTMA (trimethylolpropane trimethacrylate), a liquid trifunctional monomer, can also be added as a reactive processing aid. Zinc stearate is an activator, processing aid, and a hydrophobic diluent. Ground flash is pulverized, vulcanized core material formed as a by-product of the molding process. The ground flash increases hardness and COR and improves processing.

The peroxide crosslinks the core into a semi-rigid, resilient, thermoset polymer. There are various types of peroxides and initiators with different half-lives affecting productivity. Low levels of peroxide improve COR and durability but are more sensitive to COR loss with time. Higher levels of peroxide produce a core that is more stable but is more brittle and has lower COR vs. compression.

COVER MATERIALS

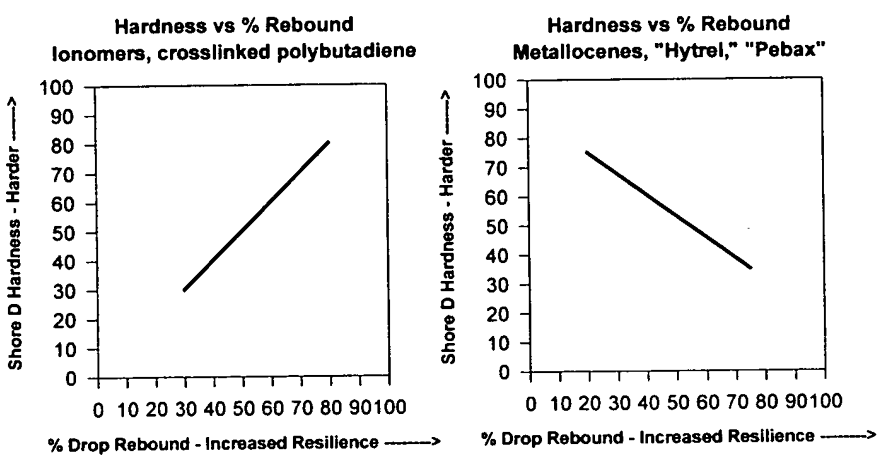
The relationship between the chemistry and physical properties of materials and their effect on golf ball performance remains an evolving science. While significant works have been presented at previous meetings and over 100 patents dealing with such topics have been issued, there remains a search for a material that better combines the properties of resilience and softness to give a golf ball maximum distance while providing high spin rates and soft feel.

Cover choices still consist of essentially three generic families of materials: ionomers, polyurethanes, and unsaturated synthetic diene rubbers such as trans-polyisoprene. While diene rubber that requires vulcanization is still in use on a few wound golf balls, its use is diminishing rapidly. This so-called synthetic "balata" suffers from poor cut resistance, relatively low resilience, and multiple-step processing that can lead to product inconsistencies. The most popular cover materials are those of the ionomer family such as those sold under the trade names Iotek (Exxon) and Surlyn (DuPont). These metal salt neutralized copolymers of ethylene and acrylic or methacrylic acid contribute outstanding resilience and durability to a wide range of golf ball types. Depending on the acid content, type and amount of cation, and molecular weight of the copolymer, golf balls with very low spin rates, good durability, and maximum allowable distance can be obtained, even at very soft PGA compressions. When the copolymer is further modified with a softening termonomer such as methyl or butyl acrylate, a wide range of moduli materials can be obtained that are useful in high-spinning golf balls, such as those described in U.S. patent 4,884,814 issued in 1988 and many others since. Ionomers are used in most golf balls because of the flexibility of design afforded the golf ball technologist as well as due to their exceptional consistency in physical properties, ease of molding, and recyclability.

Polyurethanes have been used in golf balls for decades and offer good resilience, excellent abrasion resistance, and reasonable ease of molding. They are primarily useful only in soft-covered golf balls and while they are inferior to ionomers in whiteness, resilience, and cut resistance, offer some significant performance advantages over the diene rubber covered balls.

ALTERNATE MULTI-LAYER CONSTRUCTIONS

Multi-layer golf ball covers may be soft over hard or hard over soft; both have certain advantages. A hard inner layer (or mantle) material should show increased resilience with hardness, such as ionomers or crosslinked polybutadiene. A soft mantle material should be one that shows increased resilience as the material becomes softer, such as metallocenes like "Exact" or "Engage" or polyester elastomers such as "Hytrel" or polyester amides such as "Pebax." See figures 51.1a and b.



Figures 51.1a, b Hardness vs. percent rebound.

The mantle layer can be filled with heavy materials such as powdered metals. When weight is added to the mantle layer, weight has to be removed from the core. When weight is removed from the core (zinc oxide), the COR increases and the moment of inertia of the ball increases from the weight shift.

FUTURE OUTLOOK FOR GOLF BALLS

Soft covers over hard mantles give maximum performance for low handicap golfers. We are approaching the maximum hardness using ionomers. Solid metals have higher hardness, higher flexural modulus, higher density, higher modulus of